Claims

1. Micromechanical switch, comprising a deformable suspension bridge (1), attached by support means (2) to a substrate (3), and actuating means (4) designed, from a first stable position of the switch, to deform the deformable suspension bridge (1) in such a manner as to make an electrical contact between at least one first conductive element (5) formed on the substrate (3), between the bridge (1) and the substrate (3), and a second conductive element (6), integrally secured to the underside of the bridge (1), switch characterized in that the support means are formed by two legs (7) arranged between the bridge (1) and the substrate (3) in such a manner as to subdivide the bridge (1) transversally into a medial segment (8) located between the legs (7) and two outwardly projecting peripheral segments (9) comprising free ends (15), the actuating means comprising peripheral actuating means (11) and medial actuating means (10) enabling the peripheral segments (9) and the medial segment (8) to be respectively and independently deformed perpendicularly to the substrate (3).

2. Switch according to claim 1, characterized in that the medial segment (8) comprises a raised central part (12) in the first stable position of the switch.

3. Switch according to one of the claims 1 and 2, characterized in that the free ends (15) are inclined away from the substrate (3) in the rest position of the peripheral actuating means (11).

4. Switch according to any one of the claims 1 to 3, characterized in that the actuating means are formed by electrodes respectively formed on the substrate (3) and on the peripheral (9) and medial (8) segments.

5. Switch according to any one of the claims 1 to 3, characterized in that the legs (7) are inclined.

6. Method for actuating an electrical contact of a micromechanical switch according to any one of the claims 1 to 5, characterized in that, the switch being in the first stable position, in a first phase, the medial segment (8) and peripheral segments (9) are simultaneously flexed in the direction of the substrate (3), by means of their respective actuating means (10, 11), in such a manner as to make the electrical contact, then the peripheral actuating means (11) are interrupted in a second phase so as to automatically make the peripheral segments (9) move away from the substrate (3), the medial actuating means (10) being interrupted in a third phase, the medial segment (8) thus being automatically kept in the flexed position so as to define a second stable position of the switch in which position the electrical contact remains made.

7. Method according to claim 6, characterized in that, the switch being in the second stable position, in a fourth phase, the peripheral segments (9) are flexed in the direction of the substrate (3), by means of the peripheral actuating means (11), so as to exert a mechanical stress on the medial segment (8) and to move the central part (12) thereof away from the substrate (3), the peripheral actuating means (11) being interrupted in a fifth phase to move the switch to its first stable position.

8. Method for realizing a micromechanical switch according to any one of the claims 1 to 5, characterized in that fabrication of the deformable suspension bridge (1) on the substrate (3) comprises:

- deposition of a peripheral sacrificial layer (16) on the substrate (3), on each side of the first conductive element (5),
- deposition of at least one peripheral insulating layer (17) on each peripheral sacrificial layer (16) so as to cover the front surfaces

and the side surfaces of the two peripheral sacrificial layers (16) to form the peripheral segments (9) and the legs (7),

- deposition of a medial sacrificial layer (18) between the peripheral insulating layers (17), coming into contact with the adjacent side surfaces of the two peripheral insulating layers (17) and covering the first conductive element (5),
- deposition, on the medial sacrificial layer (18), of a medial insulating layer (19) coming into contact with each of the front surfaces of the two peripheral insulating layers (17) so as to form the medial segment (8),
- etching of the peripheral side surfaces of the two peripheral insulating layers (17) so as to delineate the peripheral segments (9),
- removal of the sacrificial layers (16, 18).

9. Method for realizing a micromechanical switch according to claim 8, characterized in that the medial insulating layer (19) is deposited at least partially on the front surface of the peripheral insulating layers (17).

10. Method for realizing a micromechanical switch according to one of the claims 8 and 9, characterized in that the peripheral insulating layers (17) are each deposited on a part (20) of the front surface of the substrate (3) respectively arranged between the side surface of one of the peripheral sacrificial layers (16) and the first conductive element (5).

11. Method for realizing a micromechanical switch according to any one of the claims 8 to 10, characterized in that deposition of the peripheral insulating layers (17) is performed so as to generate a stress gradient in the peripheral insulating layers (17).

12. Method for realizing a micromechanical switch according to claim 11, characterized in that deposition of the peripheral insulating layers (17) is performed so as to generate, once the medial segment (8) has been deposited, a compression stress on the medial segment (8) in the longitudinal direction of the medial segment (8).